Am. Zool. 2: 389
1962.

The autumnal peak was associated with gonadal development in the females. Average gonadal weight of 10 females determined monthly from field collections increased from 50 mg in June, 1960 to 400 mg in September, 1960. Average gonadal weight of 10 females determined monthly from laboratory populations increased from 75 mg in July, 1961 to 1050 mg in November and decreased to 52 mg in March, 1962. Observations indicated that the digestive gland decreased in size as the gonads increased. The vernal peak was associated with molting, at which time 40% of the animals molted in 1961 and 17% in 1962. Mortality was much higher at 8-hr photoperiod, especially in the spring. (Supported by grant 3605-5038 from The University of Kansas and undergraduate research grants from the N.S.F. and Kansas Heart Association.)

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H. L. ARORA and R. W. SPERRY, California Institute of Technology. Optic nerve regeneration after surgical cross-union of medial and lateral optic tracts. (15 min.)

In fishes and amphibians excellent visual recovery with respect to color, directionality and acuity has been observed to follow section and regeneration of the optic nerve. It has been shown that the regenerating fibers not only find their former terminal loci in the optic lobe, but that they reach these terminals by preferentially following their original central pathways. In the present experiment, the medial and lateral tracts of the optic nerve in the cichlid fish, *Astronotus ocellatus*, were teased free, sectioned separately and cross-connected each to the opposite central stump in order to determine whether the nerve bundles, if deliberately directed into the wrong channels, would grow into the foreign tracts and perhaps establish connections in foreign regions of the tectum. After visual recovery in 30 to 40 days, the fish were able to follow moving objects and to localize them correctly. Histological study of the crossed regenerated tracts indicates that each fiber bundle, instead of growing ahead into the foreign channel, crossed back toward its original pathway and entered its own sector of the tectum. The results suggest that the regenerating optic fibers in this species not only prefer to follow their original central pathways but refuse to be forced to grow into the foreign channels. (Supported by grant M-3372 from the U.S.P.H.S.)

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JOHN N. BALL and KLAUS D. KALLMAN, Bingham Oceanographic Laboratory, Yale University, and New York Zoological Society. Functional pituitary transplants in the all-female, gynogenetic teleost, *Mollienesia formosa* (Girard).

Whole pituitary gland transplants were established in the tail musculature of 14 adults, which were hypophysectomised 3 weeks later (group A). Fifteen hypophysectomised individuals (group B) and 14 intact fish (group C) served as controls. A measured length of caudal fin was removed from each fish, and they were kept for 3 weeks in dilute seawater (12%) at 25°C with 9 hours illumination per day.

Eight group B fish died during the experiment, 6 with severe renal lithiasis. In groups A and C none died. Group B fish decreased in length (specific rate 0.12 ± 0.01% per day). Group A fish grew (0.10 ± 0.02% per day), though more slowly than group C (0.49 ± 0.07%). Fin regeneration proceeded at the same rate in groups A (0.20 ± 0.01 mm per day) and B (0.20 ± 0.02 mm), but slower than in group C (0.30 ± 0.03 mm), indicating a deficiency in the transplants. Within 14 days all group B fish developed corneal opacity and coarsening of the skin, not observed in the other two groups.

In another experiment, fish were transferred to freshwater. Seven group A fish lived in freshwater for at least one month, like intact controls, whereas 4 group B fish died within 36 hours, and a fifth, in acute distress after 10 hours, recovered in dilute seawater. (Supported by research fellowship HF-9500 and grant C-4945 from the U.S.P.H.S. J. N. Ball, Harkness Fellow of the Commonwealth Fund, on leave of absence from Liverpool University, England.)

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DAVID F. BALPH and ALLEN W. STOKES, Utah State University. Vocalization of male Uinta ground squirrels in Spring. (15 min.)

This paper deals with the cause and function of a call given by sexually active male Uinta ground squirrels, *Citellus armatus*. This is part of a broader study of sound communication in these animals.

The call is a series of 2-4 sharp, "chirp" sounds given at 0.1-0.2-second intervals at a frequency of 4,000-5,000 cycles per second. The series is repeated every 5-15 seconds for as long as 30 minutes.

Calling is associated with the approach of another male or by similar calling of nearby males. Males respond to the call with upright posture, returning the call, or escape. Calling males often move about their home ranges and wipe their heads on the ground. Animals call more frequently from the center of their home ranges. Peak calling periods are at midday. (Supported by Utah State University, Division of University Research.)

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EDWIN M. BANKS, University of Illinois. Ontogenesis of the motor patterns of sexual behavior in rams. (15 min.)

A flock of 8 juvenile rams was divided into three groups: 4 unaltered, 2 prepuberally castrated (118 and 139 days), 2 unaltered but deprived of heterosexual experience until after the onset of physiological sexual maturity (> 210 days). All were reared together as a unisexual flock after weaning (70 days) and were exposed to estrous ewes during a series of test periods only. Behavior displayed during tests was compared with known courtship patterns of adult, experienced rams.

The following tentative conclusions are discussed: 1. Organization of adult sexual patterns does not appear to require post-weaning heterosexual experience. 2. Organization of adult sexual patterns does not appear to require support of post-puberal levels of gonadal hormones. Further study of this point with castration performed at ages younger than those reported here are currently underway. 3. Motor patterns associated with courtship in experienced, adult rams emerge in juveniles during activi-